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HEY, HEY, FELLERS!
Whatcha Doing About Going to the Toledo Convention, June, 1927? Won't Be Long Now

MONTHLY REVIEW

Published by the

American Electroplaters Society

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EDITORIAL

From the columns of the Monthly Review we learn that the Great American Plater is going to school. Chemistry classes are being formed and the young plater, the middle aged plater and the old plater sit in class together and listen to the Professor of Chemistry explain the mysteries of his science.

The older platers who have had years of experience handling men and are quite up on modern production methods can absorb their fill of chemical science and profit thereby. It will eliminate the guess work and cut and fit methods of maintaining solutions.

On the other hand guess work and rule of thumb practice have no part in modern production methods. The plater is manager of an important department and must know how to manage a working force, also have mechanical ability to develop short cuts to greater efficiency. So then the young man fitting himself for a plating foreman's job, should not be misled into thinking that a job knowledge of metal disposition is the all essential thing needed. The plater is also a foreman among other foremen of the plant, a leader of his men and holds a strategic position between the management and the men.

E. W. Heil,
Associate Editor.

"SPOTTING-OUT"

By A. Kenneth Graham*

"Spotting-out," as spots and blemishes appearing under the lacquer on articles[1] sometimes after leaving the finishing department are designated, is a subject which has long been discussed and investigated without yielding much definite information as to its cause or elimination. In attempting to solve some problems of this nature the writer was led to some fairly definite conclusions which, it was thought, will be of general interest.

A distinction has already been made by Mr. George B. Hogaboom between the spots which are usually associated with "oxidized" finishes designated as "spotting-in" and those which may develop with other finishes designated as "spotting-out." The former is believed to be developed from without and not from within the metal as in the latter case. We shall adhere to this classification in what follows.

The cause of spotting-out beneath the lacquer if located within the metal can only be associated with imperfections—a lack of uniformity in structure. It is significant, therefore, that spotting-out is not commonly associated with rolled copper or brass, both of which are extremely uniform in composition and structure. Low grade brass castings, on the other hand, are admittedly nonuniform in these respects and commonly found to spot out.

It has been thought that spotting-out is due to the cleaning, dipping or plating solutions becoming entrapped in holes (pores) in the metal and later working out beneath the lacquer. The writer has found this to be the case, but believes that the holes may originate not only from imperfect castings producing porous metal (brass castings), but also from the action of the cleaning solutions on areas of segregated impurities in the metal (steel, cast iron, brass, etc.). The chemical attack of the solutions about these areas would be accelerated by the electrolytic effect produced by two dissimilar constituents.

A confirmation of the above opinion is found in the following: Williams and Homerberg[2] found that cathode hydro-

*Chemist, Hanson & Van Winkle Co.

[1]Articles of the common metals and alloys used in trade having received the more usual plated or dip finishes.

[2]Chem. and Met. Jour., Vol. 30, p. 589, 1924.

gen from caustic solutions produced blisters around slag inclusions in steel and that intercrystalline cracks resulted. The iron oxide in the slag is most readily attacked by cathodic hydrogen, blistering the surface, and sulphide is attacked by boiling caustic. This would produce holes sufficient to cause spotting-out in what may be regarded as sound metal, yet nonuniform in structure because of the slag.

McCullough and Reiff[3], while copper plating iron to prevent case-hardening, definitely identified holes in the deposit with slag inclusions. Other metals would undoubtedly exhibit the same tendency, not covering the slag, at least at the beginning of plating and this would give the plating solution greater opportunity to penetrate the cracks caused by the attack of the slag while cleaning.

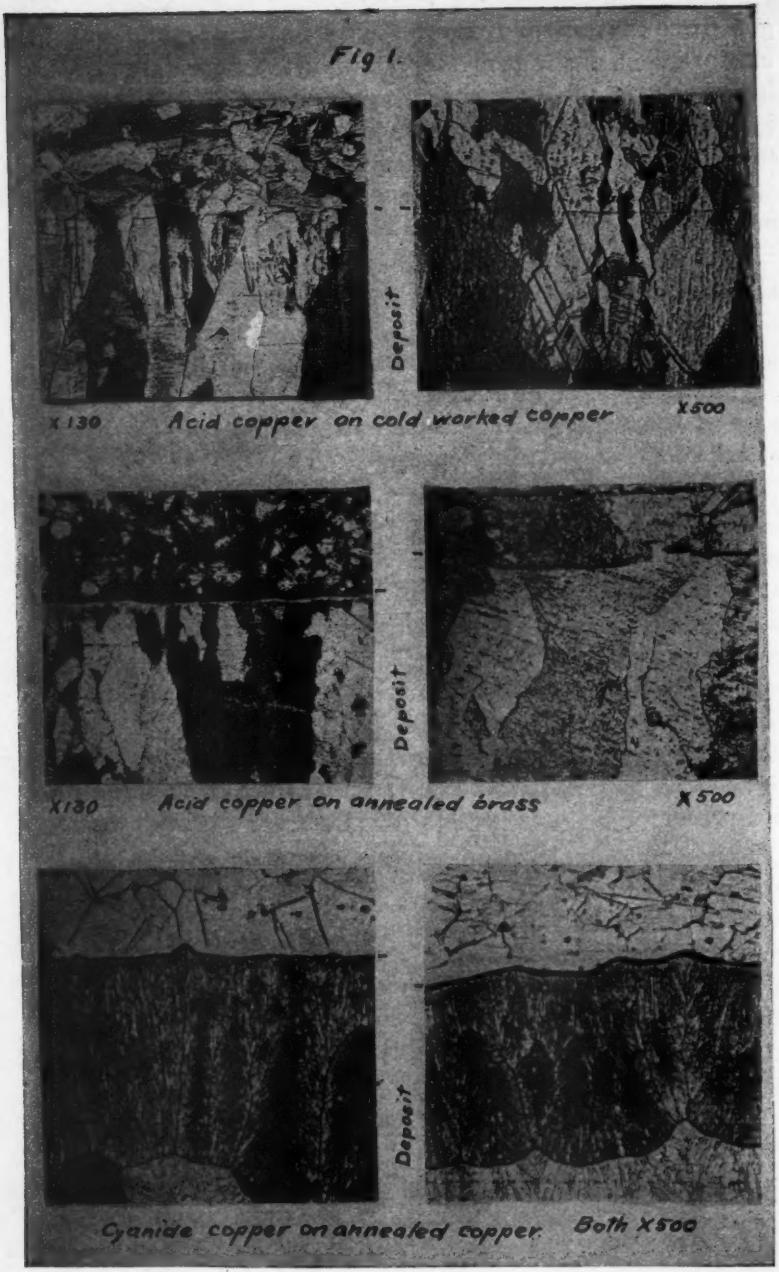
In cleaning brass, both acids and alkalies are employed. It is well known that any acid dip will attack an area of segregated impurities, as appear in low grade cast brass, more actively. Also, any blow holes will be found in these same areas and they are invariably lined with the impurities. Such common impurities that are to be found in these brass castings as lead, iron, aluminum, tin and sometimes sulphur, will be readily attacked by the combined action of acids and alkalies. This would leave the metal more porous and susceptible to spotting-out than would be the case were these impurities not present.

This simple explanation of spotting-out is not necessarily original. It has been gleaned from opinions expressed in the literature, from practical platers and experience. In the experimental work on cast brass about to be presented it satisfies the results obtained. With cast iron, steel and die castings of various alloys it is very probable that it will be found to apply, but further experimental work is required to determine this.

Experimental Work

The fact that rolled copper and brass do not commonly spot out is all the more easily understood if plated articles are examined under the microscope. In a previous article[4] attention has been called to the extremely uniform structure

[3]Jour. Ind. Eng. Chem., Vol. —, p. —, 1924.
[4]Graham, Jour. Am. Electrochemical Soc., Vol. 44, 1923.



of the base metal and how markedly the acid copper deposit is influenced in uniformity and structure. (Fig. 1.) That all

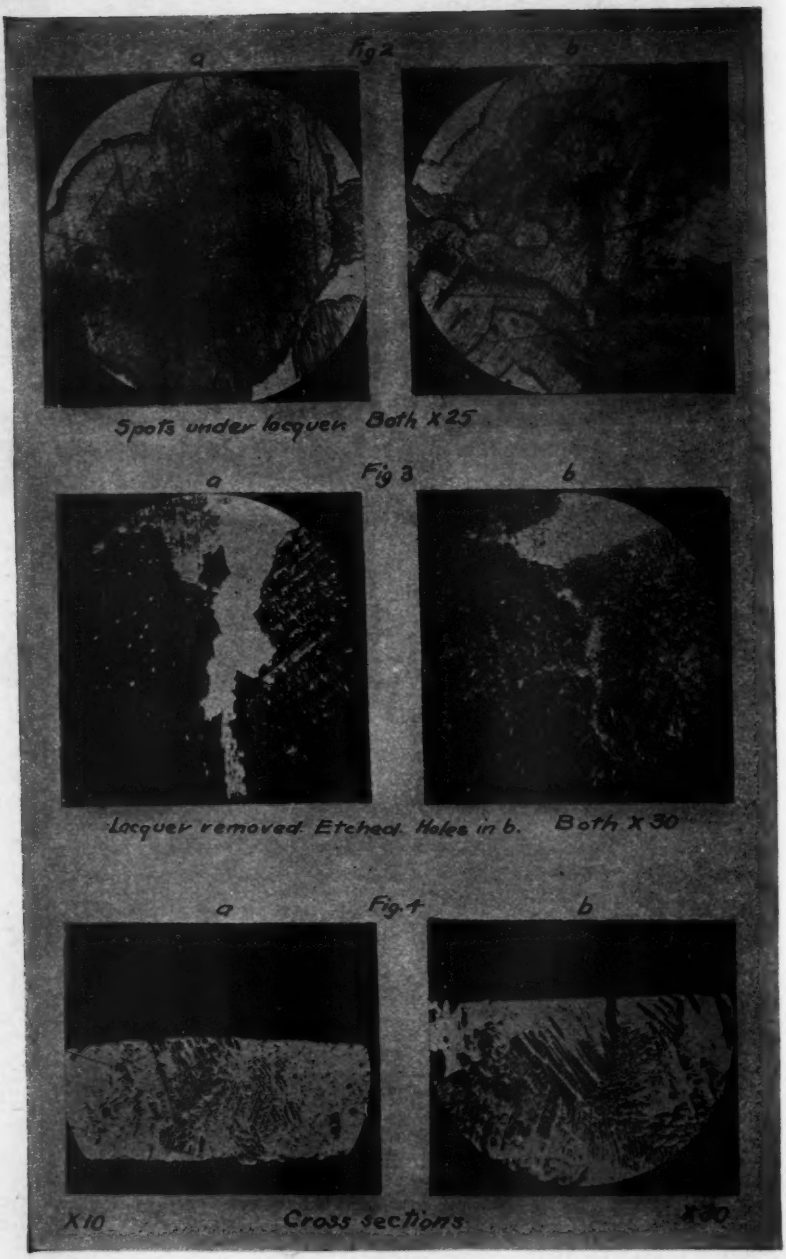
metals deposited on such base metals should be equally uniform is to be expected. It would be difficult to conceive of spotting-out under such conditions.

With cast brass, if our theory is correct, it matters not whether a bright-dip or plated finish—e. g. cyanide copper—is used. In either case the solution would become entrapped in the holes and gradually work out under the lacquer. This point has been verified, but if anything it is more severe with the acid dip so that in the work with brass only the dip finish was used.

A cast brass chain keeper was given a bright dip finish and later spotted out. The spots remained on removing the lacquer and reappeared at the same places on refinishing. The article was then cut in two and the first part refinished by stripping, dipping and then treating with cyanide, soap, cold and hot water. It was finally dried and lacquered with ordinary cotton lacquer to which had been added a small amount of phenolphthalein dissolved in alcohol. Spotting-out occurred at the old places, but this time in the form of red spots. The phenolphthalein was changed from its colorless to red form and this change can only be produced by free alkali. The only alkali used was in the form of cyanide and this had therefore been held in the metal causing the spotting-out.

The second part of the chain keeper was refinished in the same way only omitting the cyanide solution and adding an alcoholic solution of methyl orange to the lacquer in place of the phenolphthalein. Spots developed but the indicator was not apparently affected. It at least showed that the spots could develop without the use of alkali cyanide, only the acid dip having been used, and heavy metal salts would not be expected to react strongly with an indicator.

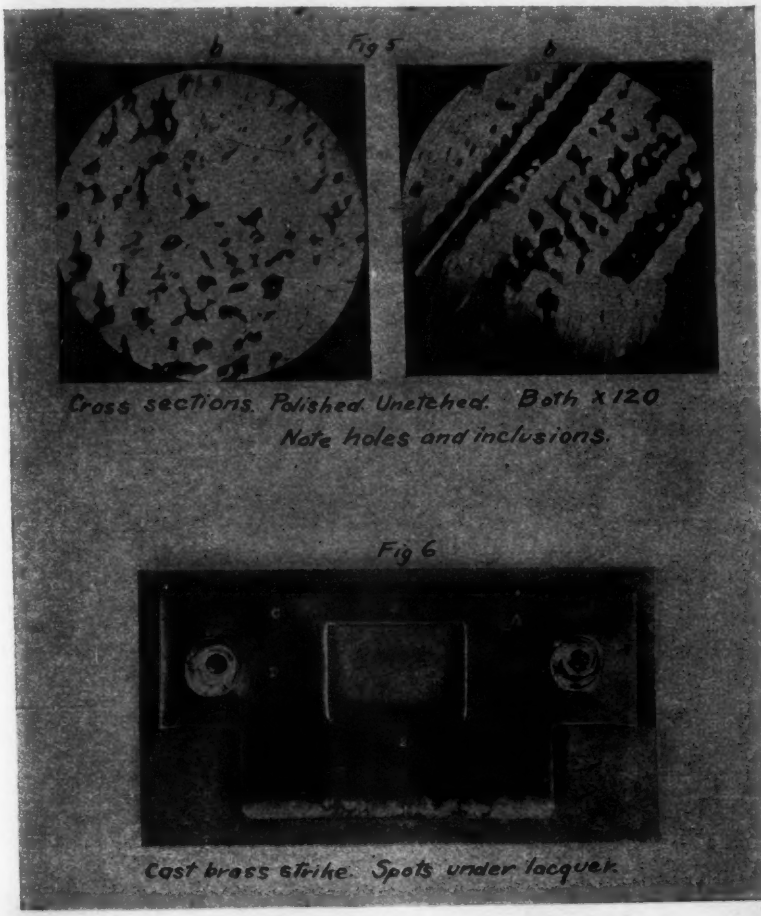
A cast brass escutcheon which had spotted out after receiving a bright dip finish was examined under the microscope. Fig. 2 shows two spots as they appeared under the lacquer. Holes are plainly seen and the spots run out from these like a drop of water spreading on a surface. After removing the lacquer and etching (Grard's Acid $FeCl_3$) further observation showed a very coarse structure and staining of the surface in the same areas that the spots had existed. Figure 3 shows the structure of the metal on the surface at the two spots



originally examined (Fig. 2) and in 3 (b) holes are to be seen in the crystal boundary. On cutting sections perpen-

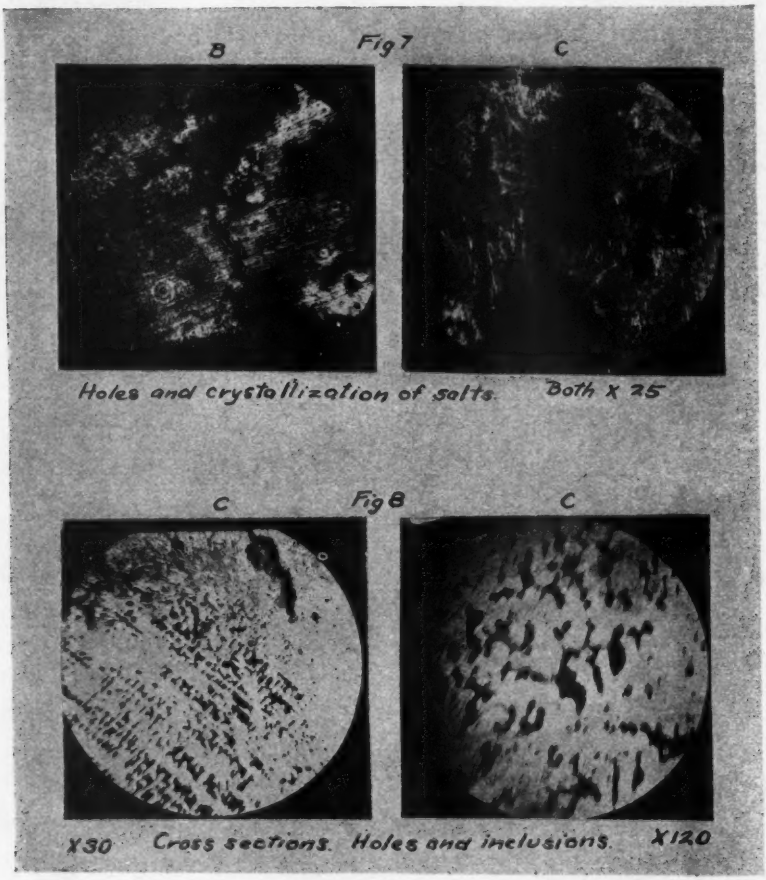
dicular to the surface at (a) and (b) and polishing, a very porous structure was revealed on examining under the microscope. See Fig. 4. Holes may be seen extending from the surface deep within the metal.

It is not hard to see how the solutions could be entrapped in metal such as the above. The porous structure revealed, however, need not have been just a network of holes before it was placed in the finishing solutions. In fact the writer has stated that impurities must be associated with such a structure which upon dissolving leave the metal still more porous. In preparing the sections (Fig. 4) on the polishing



wheels such impurities are most readily loosened and lost. Figure 5 shows a little of the material still present.

In order to prove this point more conclusively and to determine what impurities might be present a cast brass strike (Fig. 6) was examined and badly spotted areas designated

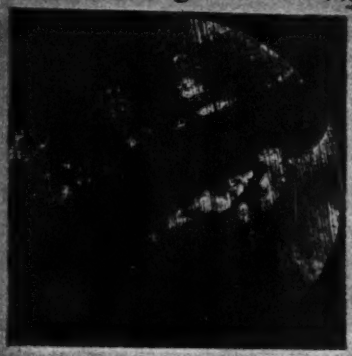


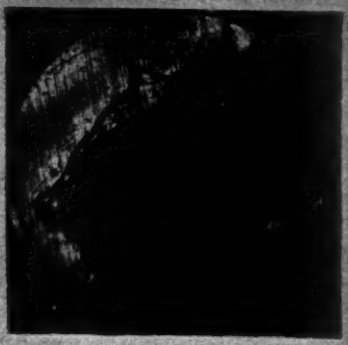
A, B, C and D. Figures 7 and 9 show pictures of spots under the microscope at these areas. Attention is called to the feathery appearance of C and D which is believed to be caused by the crystallization of salts contained in the solution seeping out of the metal. Figures 8 and 10 are sections perpendicular to the surface at C and D respectively. In the former some areas of the impurities have withstood the polish-

D

Fig 9

D





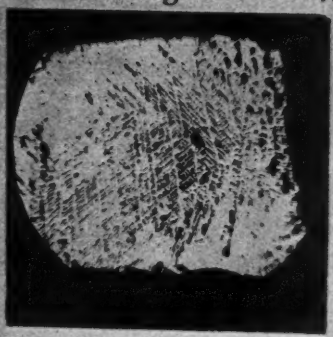
Spots under lacquer. Holes.

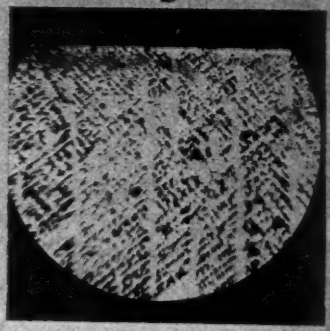
Both x 50

D

Fig 10

D

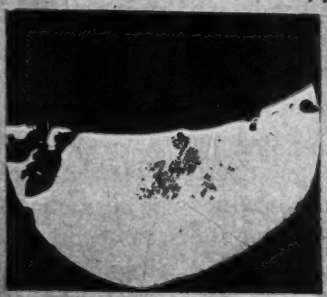




X10 Cross sections. Holes and porosity.

X30

Fig 11



Holes in window strike and sweep.

Both X10

ing operation, are still visible and offer additional proof of this point.

Analysis of the metal at A and C ÷ D gave the results in Table I.

Table I

	Fe+Al	Sn	Pb	Cu	Zn	
	%	%	%	%	%	
A.	0.81	0.12	3.54	71.36	24.17	(dif.)
C÷D	0.71	——	——	——	——	
Blank	0.44	0.36	3.56	71.31	24.33	(dif.)

The blank sample was taken where there were no spots and where the metal appeared perfectly sound. Of the impurities present the iron and aluminum are regarded as the most objectionable and a higher percentage was found at the unsound areas examined. It is also claimed that aluminum is particularly detrimental to brass casting when a high percentage of lead is present[5]. The fact that there is any variation in composition is a proof of nonuniformity and segregation.

Further work was carried out on window strikes and window sweeps. Fig. 11 shows two imperfect sections. Where such structures were revealed spotting-out occurred on finishing. Also, where sections revealed perfectly sound me no spotting-out took place after finishing.

Conclusion

Knowing the cause of spotting-out should enable one t more intelligently correct the difficulty. For cast brass on would naturally suggest sound metal. This would undoubtedly improve it, but the possibility of obtaining perfect castings from scrap metal for average grade sand cast articles is rather remote. The one recommendation that can be made is for the maintenance of good casting conditions and the eliminating as far as possible of impurities.

It might be added, particularly if this theory of spotting-out also holds for other metals, that the shorter time the metal is left in contact with the cleaning solutions the less chance will there be for porosity to develop and spots to occur.

The writer wishes to thank Mr. George B. Hogaboom for his co-operation and Dr. H. S. Lukens for his usual kindly interest and suggestions.

[5]Met. Ind., Vol. 22, p. 275, 1924.

SILVER CYANIDE PLATING SOLUTION

F. H. Nordman

THEORY

The fundamental reactions in silver plating solutions when subjected to electrolysis are comparatively simple. The double potassium silver salt in solution is ionized according to the equation:

$$KAg(CN)_2 = K^+ + Ag(CN)_2^- \qquad (1)$$

This primary ionization is undoubtedly accompanied by a secondary slight ionization of $Ag(CN)_2^-$.

$$Ag(CN)_2^- = Ag^+ + 2\ CN^- \qquad (2)$$

The entire ionization reaction may then be stated:

$$KAg(CN)_2 = K^+ + Ag^+ + 2\ (CN)^- \qquad (3)$$

The free cyanide is ionized according to the following reaction:

$$KCN = K^+ + CN^-$$

On electrolysis the selective neutralization of the positive ions present is dependent upon the voltage impressed. That ion which is most easily neutralized will be deposited and will continue to be deposited as long as any of that type ion remains, provided the voltage impressed is such as to allow a selective neutralization of charge. Any voltage impressed that is sufficiently high as to allow the neutralization of the most difficult neutralizable ion will likewise effect the deposition of the two metals simultaneously. In the case of silver cyanide plating solutions, it is probable that the silver ion is the most easily neutralized and therefore one would expect the deposition of the silver molecule at the cathode without any change in the potassium ion present. At the cathode then the reaction is as follows:

$$Ag^+ + {}^{(-)} = Ag$$

At the anode, which in silver plating is silver, the CN^- is neutralized by a positive charge.

$$2(CN)^- + 2^{(+)} = 2(CN)$$

The metallic silver anode is attacked by the liberated (CN) radical resulting in the formation of $Ag(CN)_2$.

$$Ag + 2(CN) = Ag(CN)_2$$

This compound is immediately ionized according to reaction (2), and the cycle of electrolysis repeats itself.

It would be well to consider here the first objection to the use of sodium cyanide in place of potassium cyanide, namely,

that of causing increased "spotting-out" and difficulties in burnishing. Although the question of spotting-out has not been systematically investigated, the general opinion is that this phenomenon may be attributed to the occlusion of cyanide in the pores of the plate. With inefficient washing these cyanides remain in the pores, and being deliquescent attract moisture and corrode the base metal. If spotting out is more pronounced with the use of sodium cyanide, the most logical conclusion is that the deposits from sodium cyanide baths possess a physical structure different from deposits obtained from potassium cyanide baths.

The factors that ultimately affect the type of deposit obthained may be classified as follows:

1. Current density.
2. Temperature.
3. Metallic ion concentration.
4. Type of metal deposited on.
5. Presence of colloids, etc.

If the current density, temperature, base metal, and type of solution are maintained constant, the only difference in the physical structure of the deposit would seem to be due to different metallic ion concentrations in the two solutions. The metallic ion concentration of baths of this type has never, to the writer's knowledge, been determined. An examination of the deposits from a bath made from C. P. sodium cyanide and one made from C. P. potassium cyanide should show if there exists a difference in the metallic ion concentration, at least to the degree that affects commercial operation.

Inasmuch as commercial cyanides are not, in general, exceptionally pure, especially sodium cyanide, the effect on the character of the deposit of such impurities as chlorides, hydroxides and carbonates should be considered. Chlorides are often added to sodium cyanide to decrease the total cyanogen content to one hundred per cent potassium cyanide equivalent; hydroxides may be present from the original preparation; carbonates are formed as a decomposition product of cyanides exposed to air. An examination of the fundamental reactions, previously given, seems to indicate that, under given conditions of electrolysis there should be no difference in the type of deposit obtained in the presence or absence of these impurities. The only minor reaction that

might take place would be between these salts and metallic silver; it is doubtful whether this is sufficiently great to affect the character of the deposit. Frary and Porter (2) investigated the effect of potassium chloride and potassium hydroxide on the simple potential of various metals used as cathodes. No appreciable different results were obtained in the presence of potassium chloride and potassium hydroxide. One would therefore expect no adverse effect on the type or adhesion of the deposit.

A thoretical examination of the fundamental reactions of electrolysis, previously stated, shows that regeneration of the bath should be unnecessary, since there occurs only dissolution and deposition of the silver. However, this is not the case. Decomposition of the free cyanide occurs with the formation of carbonates, formates, ammonia, etc. But little investigation as to the products and reactions of decomposition has been attempted, so that the reactions themselves are very little known. Theoretically, the three factors that may account for the decomposition of the solution are as follows:

1. Hydrolysis.
2. Presence of air.
3. Electrolysis.

A resume of the literature shows that very little has been done to determine the proportion of decomposition that may be due to each of the above factors. Provided that these factors are equal in magnitude in the case of baths made from potassium cyanide and sodium cyanide, the rate of decomposition in each case would in all probability be the same.

The reactions of hydrolysis may be briefly stated as follows:

1. The potassium cyanide is hydrolyzed in neutral solution.

$$KCN + H_2O = KOH + HCN$$

2. The hydrocyanic acid in the presence of an alkali and water breaks up, forming ammonia and formic acid.

$$HCN + 2\ H_2O = H_2CO + NH_3$$

3. In the presence of an alkali, the formate of the alkali is formed.

$$KOH + H_2CO_2 = HCOOK + H_2O$$

The above reactions may be represented by a single equation

which shows the hydrolysis of potassium cyanide.

$$KCN + 2\ H_2O = HCOOK + NH_3$$

Worley and Brown (3) investigated the hydrolysis of sodium cyanide in connection with the dissolution of gold and found that at 20° C. the value of the hydrolysis constant multiplied by 10^4 was equal to 0.27. To the writer's knowledge, no work has been done on the hydrolysis of potassium cyanide solutions at ordinary temperatures. There is, therefore, no data available on which to base a determination of the different amounts of hydrolysis of free sodium and potassium cyanides in cyanide plating solutions.

The presence of such impurities as chlorides and carbonates should have no effect on the extent of hydrolysis. Hydroxides would decrease it due to the common ion effect.

Many practical discussions on electroplating note that the formation of the carbonates in silver cyanide plating solutions is probably due to the absorption of carbon dioxide from the air. Jordis and Stramer (4) noted that a silver cyanide plating bath, when not being used, increased in carbonate content on standing in contact with air. A number of authorities on general chemistry mention the fact that when moist air comes in contact with potassium cyanide, potassium carbonate is formed and hydrocyanic acid gas is liberated. One would, therefore, conclude that in the presence of air, the plating solution would take up carbon dioxide, with the subsequent removal of two molecules of potassium cyanide for the formation of one molecule of carbonate.

$$2\ KCN + H_2CO_3 = 2\ HCN + K_2CO_3$$

Atmospheric air might have an oxidizing action on potassium cyanide, forming potassium cyanate, and this on hydrolysis would yield potassium and ammonium carbonates.

$$2\ KCN + O_2 = 2\ KCNO$$

$$2\ KCNO + 4\ H_2O = (NH_4)_2CO_3 + K_2CO_3$$

Thus for every two molecules of cyanide decomposed there should be formed two molecules of carbonate.

The effect of impurities such as chlorides, carbonates, and hydroxides on the decomposition of cyanide due to the presence of air may now be noted. Theoretically there is no apparent reason why chlorides should have an effect on the rate of decomposition. Hydroxides might aid in the absorption of the carbon dioxide from the air, giving an increase in car-

bonic content, without the same proportional increase in the decomposition of the cyanide.

$$2\ KOH + H_2CO_3 = K_2CO_3 + H_2O$$

The presence of carbonates should have no decided effect on the decomposition of the cyanide.

Jordis and Stramer (4) also noted that the decomposition of the free cyanide in a silver cyanide plating solution was greater when the solution was being electrolyzed than when it was idle. Just why this decomposition would be different in a bath in use is not at once apparent. The reactions of electrolysis have been previously stated. Theoretically, there seems to be no explanation of why the decomposition should increase on electrolysis. However, when the mechanical details of electrolysis are investigated, the loss of KCN may be accounted for. For instance, the silver anode is hung on an iron wire, which extends into the solution. There is therefore every possibility of the liberation of the $(CN)_2$ radical where it cannot attack the silver; it perhaps does not attack iron, so that it is liberated. It might combine with any base present to form the cyanide and the cyanate, according to the equation:

$$(CN)_2 + 2\ KOH = KCN + KCNO + H_2O$$

The cyanate might then be hydrolyzed, according to the reactions given above, to produce ammonium and potassium carbonates. This decomposition would not decrease the free cyanide content; it would however result in the formation of carbonates at the expense of the decrease in the combined cyanide present.

Then, too, if the voltage was such as to cause the neutralization of a potassium ion simultaneously with the deposition of silver, the effect would be the electrolysis of potassium cyanide.

$$K\ Ag\ (CN)_2 = K^+ + Ag^+ + 2(CN)^-$$
$$KCN = K^+ + CN^-$$

The potassium, liberated at the cathode, would combine with the water present to form potassium hydroxide and hydrogen.

$$2K^+ + 2H_2O = 2KOH + H_2$$

The (CN) liberated at the anode would attack the anode according to the reactions previously given. Such a series of reactions would result in the decomposition of free cyanide, with the subsequent formation of a molecule of potassium hydroxide.

The presence of such impurities as hydroxides, carbonates and chlorides would tend to cause an oxidation reaction, similar to that caused by potassium cyanide, provided the deposition voltage of the chloride, hydroxyl and carbonate ions was reached. Jordis and Stramer (4) noted that the formation of carbonates was greater when the cyanide plating solution contained chlorides than when it was free from chlorides. This can only be accounted for by assuming that such a voltage was being used that the deposition voltage of the chloride ion was reached. The oxidation reactions discussed above would then account for the increase in carbonate formation.

A consideration of the above reactions when comparing plating solutions made from sodium cyanide and potassium cyanide shows that there are few reasons why there should be any difference in the rates of decomposition. It may be noted here that sodium carbonate is much less soluble than is potassium carbonate, a fact that might have an influence on the reactions of carbon dioxide of the aid on the solution. on the equilibrium between carbonates and cyanides; also,

(To be continued)

PITTSBURGH BRANCH

Our meetings that have recently been held in the Down Town Branch Y. M. C. A., Pittsburgh, have been very well attended, and much more interest is being shown by the members, and we all hope the good work continues. Last Saturday night we had a record number present and several questions came up for discussion, several members came with a sample of their nickel solutions, for testing for pH with the Double Wedge Comparator, and the range ran clear from one end of the scale to the other, and each member said that his OWN solution was right to standard and could not be improved upon. Next meeting it is hoped the members will remember to bring more samples, when test will be made with the LaMotte Ion Comparator, when the results will be checked. The question of Saw Dust was brought up, and we found that none of the platers in the district were using this material for drying; other methods, such as hot air, ovens and other mechanical methods were the rule. One of the members had samples of copper, brass and nickel work to pass around, but would not answer any questions as to how the finish was obtained, just saying, match the work if you can, and make your samples better if possible, when at a later date a discussion will be had upon the various finishes and the methods used. This is, to my mind, a good way to see just what the platers will and can do, and ought to pave the way for some good talks later.

S. E. Hedden, Secy.

TOLEDO BRANCH

Hooray: Coming to 1927 Convention

Toledo, Ohio, the city selected for this year's convention of the National Electro-Platers Association, to be held June 29 and 30 and July 1 and 2, is known as the Gateway City to the Great Lakes.

The city located on Maumee Bay and at the hand of picturesque and historical Maumee Valley, together with many beautiful parks and drives, make it an ideal and interesting city for the visitors. In the summer months palatial steamers give the visitor an opportunity for a refreshing ride on Lake Erie visiting historical Put-In-Bay and other interesting ports.

Toledo's Museum of Art has become an art center of international reputation. Its collections of paintings, Egyptian antiques and glassware are world famous.

One of Toledo's accomplishments and one in which they are justly proud of are the many beautiful schools.

Toledo has thirteen parks, three public golf courses and in addition seven private golf courses and five yacht and canoe clubs, affording a diversion of recreation for its visitors.

Toledo is internationally known for its wonderful railroad transportation facilities with seventeen main lines and seven branch lines reaching out to all sections of the country, 116 express trains enter and leave Toledo daily. In addition to the railroad transportation the large lake freighters are arriving and leaving constantly during lake shipping season. Toledo is the soft coal port of the United States, over fourteen million tons of coal were shipped from Toledo ports last year.

Toledo has in the neighborhood of 700 factories of a diversified nature producing over 1,200 different articles.

Situated in the center of a thickly populated district with ready transportation to a number of the nation's leading cities the question of distribution does not trouble Toledo manufacturers.

Toledo is the largest children's vehicle manufacturing center in the country. The Gendron Wheel, American Wheel and Toledo Metal Wheel, manufacturers of the various kinds of children's vehicles, are among the foremost manufacturing concerns in the city.

One of the outstanding features assuring amicable working conditions is a matter of home ownership. Practically 50 per cent of Toledo's population own their own home, which tends to make a more satisfactory condition to the life of a city.

PHILADELPHIA BRANCH

Philadelphia Branch held the regular meeting at the U. of P., March 4th.

A large number of members were present to see the demonstration of the silvering mirrors by Mr. R. Massicotti, assisted by Mr. Hirsch. Among which were a number from Reading, who took a lively interest in the talk and later explained their method of using the same formula in silvering glass doorknobs.

Mr. E. R. Clark reported receiving thirty replies to the post card appeal for subscriptions for the research fund. He urged the members

to send in their replies, as nothing can be accomplished if the members do not put their shoulder to the wheel and help the good work along

Question was asked how to remove oxidization on the backs of enameled white gold bissels. Information to solve this problem will be appreciated.

TORONTO BRANCH

Toronto Branch members held their annual euchre in Foresters Hall, February 28th. The success of this social affair was beyond all expectations.

Messrs. Barrows, Achison and O'Keefe being the responsible committee from start to finish.

Members' wives, who formed the Ladies' Committee, were equally guilty for the evening's success, with the wonderful display of appetizing eats, while friends of the members who possessed the complimentary qualifications were not lacking in their appreciative and kind remarks.

The regular business of the branch was gone through between eight and nine o'clock. Reading of the minutes, communications, bills, etc. President W. S. Barrows presented a letter from the Engineers' Mutual Society for endorsation regarding an exhibition of steel power machinery and steel goods. Letter was read from Toledo convention committee, which will be taken care of, with the promise of results in the near future. J. S. Cairns, Secy.-Treas.

HARTFORD-CONNECTICUT VALLEY BRANCH

Report of January Meeting

Hartford-Connecticut Valley Branch met in Springfield, Mass., on Monday evening, January 24th, with President Kennedy in the chair and an attendance of thirty. One application for active membership was received and one member resigned because of his being no longer connected with the industry.

In response to a request from the Toledo Convention Committee, Mr. Joseph K. Preston was asked to prepare a paper on "Chromium Plating," to be read at the convention.

Mr. Floyd T. Taylor was with us at this meeting and gave a most interesting talk on "Plating Room Control," which, judging by the discussion that followed, made a decided hit with those present.

T. Elwin, Secy.

Report of February Meeting

The February meeting of Hartford-Connecticut Valley Branch was held at the plant of the Arrow Electric Co. in Hartford on Monday, February 28th, and was well attended. One new member was elected and two applications for membership were received.

Mr. D. J. Benoliel read a paper on "Industrial Cleaning," covering the history of modern cleaning methods and various applications of cleaning compounds in the plating room.

After the meeting the members were given the opportunity of seeing the plating and lacquering departments of the Arrow Electric Co., which contains some interesting labor saving machinery developed by Mr. MacFadyen, who explained everything in detail. T. Elwin, Secy.

NEWARK BRANCH

Newark Branch held its educational meeting on Friday, March 4th, Geo. Onksen presiding, with twenty-four members and four visitors present.

Voted that Bert Stone be suspended for non-payment of dues.

Mr. Schnering spoke on White Gold and Platinum Plating.

Mr. Chas. Proctor spoke on Cadmium Plating and gave the following formula for a solution: Water 1 gal., sodium cyanide 6 oz., cadmium oxide 1 oz., potassium hydroxide ½ oz., oxide of mercury ⅛ oz., postum 1 oz. Temperature 110 degrees Fahrenheit, for a 10-second flash.

Chromium Plating was discussed and resulted in Mr. Proctor giving the following formula: Water 1 gal., chromic acid 20 oz., chromic sulphate 1.4 oz., boracic acid ½ oz. Temperature 95 to 120 degrees Fahrenheit, 10 to 12 volts, 500 amperes per square foot, using the iron tank or anode.

Mr. G. R. Taylor spoke on the method he uses in removing the black scale on Britannica hollow ware which is to be refinished in silver. 50-50 solution of hydrochloric and water used as a dip.

Mr. Proctor recommended 1 gal. water, 4 oz. caustic potash, 2 oz. sodium bichromate to remove scale from peuter articles to be re-silverplated.

Bronze solutions were discussed and Mr. Proctor advised the use of bisulphite of soda, copper, zinc and cyanide for best results and to avoid carbonates by all means. Royal F. Clark, Secy.-Treas.

NEW YORK BRANCH

The New York Branch held its eighteenth annual banquet and educational session at the Aldine Club, New York City, Saturday, February 19, 1927. The educational session, which was presided over by our founder, Mr. Charles H. Proctor, proved very interesting. The program consisted of the following: Some odd coloring on brass and copper goods by F. J. MacStocke and T. A. Gardner. Very beautiful samples were displayed of the finishes.

Mr. F. T. Taylor of the A. P. Munning Co., on Electrical Equipment of the Plating Room was very instructive.

Mr. Graham of Hanson Van Winkle Co. was very precise in his talk, which was on general methods used in plating rooms. Then our old friend, Dr. William Blum, held those attending the session spellbound on his talk on the Selection and Specification of Electroplating.

Dr. Colin G. Fink concluded the program by his talk and views on The Restoration of Ancient Bronzes.

The session was attended by over 200.

The banquet was held in the evening and more attended than the committee anticipated, therefore necessitating a second serving at the tables to accommodate the overflow. The tables were decorated with beautiful favors and handsome souvenirs were distributed to ladies and gentlemen. After the banquet dancing was in order and music was provided by an excellent orchestra. The banquet was attended by 550 and all the branches of the A. E. S. were well represented. Our Supreme President, Mr. F. C. Mesle, Supreme Secretary Geo. Gehling and many Supreme past-presidents were among those present.

DETROIT BRANCH

Regular monthly meeting of the Detroit Branch held March 4th, at the Detroit Testing Laboratory, with President J. Flanagan in the chair and a good attendance.

One applicant was elected to active membership. Also received one member from Cleveland Branch and transferred one to the Chicago Branch.

General discussion was regarding a chemical class, the committee having reported they would have an answer as to whether the Cass Tech. would be available for us on about Monday next, when a report would be had from the Board of Education. It was decided that as soon as the committee received an answer, if favorable, the Secretary should send out notices to all the members and definite steps taken at a special meeting to express their views.

Mr. Barber, one of the oldest members of the society from Bridgeport Branch, gave a most enjoyable talk. His subject being, The Use of the Ampmeter as a Means of Determining the Weight of Deposit from Solution.

C. Mascola, Secy.

DAYTON BRANCH

Dayton Branch held its monthly meeting March 5th at Y. M. C. A. building. We had a fine gathering of the members.

The speaker of the evening was C. E. Vanderan of Westinghouse Electric Manufacturing Co. at Mansfield, Ohio, who gave us a lecture on Chrome Plating as it is done in production, also exhibited samples of this work, which was best we have seen, and the lecture sure was instructive and very well handled by Van, who has the knack of bringing out the smallest details of these explanations and it sure is a pleasure to have him with us, and any Dayton members who were not there sure missed a real treat and we hope Van will call again soon and make his visits many.

The question box was full and many topics were discussed and we adjourned at a late hour.

Robt. G. Suman, Secy.

Banquet Notice

Newark Branch will hold its ninth annual banquet at Achtel-Stetter's, 842 Broad street, Newark, on Saturday, April 30, 1927. Afternoon educational session beginning at 3 p. m. Banquet 7 p. m., followed by dancing. Ladies are expected to attend as usual. Tickets $3.00 per person.

Newark Branch held its business meeting on Friday veening, February 18, 1927, with twenty-one members present. President Geo. Onksen presiding.

Minutes were approved as read. One application for associate membership was voted to take the usual course. Banquet committee reports progress on our banquet, which will be held on April 30th.

Librarian Calabrese reported that he was quite sure he will secure a paper to be read at the Toledo convention.

Royal F. Clark, Secy.-Treas.

CHICAGO BRANCH

Regular monthly meeting, Chicago Branch, held March 12, 1927, at the Atlantic Hotel.

The meeting was called to order with President Jacob Hay presiding, and a very good attendance.

President Hay called the attention of the members to the joint meeting of the American Chemical Society and the American Electro Platers' Society, same to be held at the City Club, 315 Plymouth Court, Friday, March 25, 1927, at which Dr. Wm. Blum will speak on Research on Electro Plating Solutions.

Mr. Oscar E. Servis, our librarian, called upon the members for papers for the Toledo convention and was promised a few; he also called attention to the Research Fund Drive.

The Booster Committee for the coming convention reported that there would be a good attendance from Chicago.

The balance of the evening was given over to our Librarian, who found the following questions:

R. Meyers, Secy.

Question Box Chicago Branch

Question 1.—Wanted information on ball burnishing iron and steel. What is a good soap or other agent to use for the burnishing operation? Answer 1.—Lux Soap Chips was recommended as a good soap, same to be followed by a 10 per cent muriatic acid dip before work is plated.

Question 2.—Is there any other bright dip other than acid dip on sheet brass? Answer 2.—A dip made up of 10 ounces of potassium bichromate, sulphuric acid 3 to 4 ounces, water 1 gallon. Temperature 175 or more was given.

Question 3.—How can aluminum sheets be etched so as to produce a fairly rough surface? Answer 3.—Muriatic acid with a small addition of chloride of iron.

Question 4.—What is a good brightener for a cyanide copper solution? Answer 4.—Nickel cyanide, lead carbonate cut down with caustic soda, liver of sulphur and hypo was suggested.

Question 5.—Can copper be plated on chromium? Answer 5.—It was stated that it cannot be done.

Question 6.—How can spotting out on sheet brass copper plated and oxidized with liver of sulphur for statuary bronze? Answer 6.—Acid copper plate followed by a black nickel made up as follows: 8 ounces single nickel salt, 2 ounces sulpho cyanide, ¾ ounce zinc sulphate, ½ ounce sal ammoniac.

Question 7.—What is the proper way of introducing chromium sulphate into chromic acid when preparing a new chromium solution? Answer 7.—Will anyone answer this.

BOSTON

Regular meetings are held first Friday of each month, at 8 p. m., at the Boston Platers' Supply Co., 202 Friend St., Boston. Secretary, A. W. Garrett, 24 Juliette St., Dorchester, Mass.

BRIDGEPORT

Meets first and third Friday of each month at 62 Cannon St., Room 17, Bridgeport, Conn. Secretary Wm. Ehrencrona, 872 Hancock Ave., Bridgeport, Conn.

CHICAGO

Meets second Saturday of each month, at 8 p. m., Atlantic Hotel, 316 S. Clark St. Secretary, Robt. Meyers, 2432 Wilson Ave., Chicago, Ill.

CINCINNATI

Meets every Thursday, 7:30 p. m., at Vocational Training School, Spring and Liberty St. Secretary, Al. Yeager, 2021 Sherwood Ave., Norwood, Ohio.

CLEVELAND

Meets nrst Saturday of each month at Hotel Winton. M. E. Zadowski, 6517 Bridge Ave.

HARTFORD-CONN. VALLEY

Meets rourth Monday in each month alternately at 266 Pearl St., Hartford, Conn., and corner Broadway and Worthington St., Springfield. Tennant Elwin. Secretary, 117 Hobart St., Meriden, Conn.

DAYTON

Meets first Saturday of each month at the Y. M. C. A., Dayton, Ohio. Secretary, Robert G. Suman, 66 Notre Dame Ave., Dayton, Ohio.

DETROIT

Meets the first Friday of each month at the Detroit Testing Laboratory, 554 Bagley Ave., Detroit. Secretary, Chas. Mascola, 2041 Beard Ave., Detroit, Mich.

GRAND RAPIDS

Meets on the second Saturday of each month at the Vocational High School, 129 Bostwick Ave., N. E. Secretary, Jacob Van Dyke, 1361 Union Ave., N. E., Grand Rapids, Mich.

INDIANAPOLIS

Meets the second Saturday of each month at Hotel Denison. Secretary, Louis Mertz, 1725 Union St., Indianapolis, Ind.

MILWAUKEE

Meets second and fourth Thursdays of each month at Lipps Hall, 321 3d St. J. N. Hock, 1229 W. 24th St., Milwaukee, Wis.

MONTREAL

Meets last Friday of month at Office of Secretary, John H. Feelay, 411 Aylmer St., Quebec, Canada.

NEWARK

Meets first and third Fridays of each month at Franklin Hall, 41 Franklin St., Newark, N. J., at 8 p. m. Secretary-Treasurer, Royal F. Clark, P. O. Box 201, Newark, N. J.

NEW YORK

Meets every second and fourth Fridays of each month in the World Building, Park Row, New York City, N. Y. Secretary, J. E. Sterling, 2595 45th St., Astoria, L. I.

PHILADELPHIA

Meets first Friday of each month in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Sts. Secretary, P. Uhl, 2432 North 29th St., Philadelphia, Pa.

PITTSBURGH

Meets first Saturday of each month at 8 p. m., at United States Bureau of Mines Bldg., Forbes St. Secretary, S. E. Hedden, 227 Fifth St., Aspinwall, Pa.

PROVIDENCE-ATTLEBORO

Meets first and third Thursday of each month at 44 Washington St., Prov. Engineers Rooms, Providence, R. I. Secretary, J. H. Andrew, 19 Rosedale St., Providence, R. I.

ROCHESTER

Meets every third Friday of each month at the Powers Hotel. C. A. Reama, Secretary, 512 Lyell Ave., Rochester, N. Y.

ST. LOUIS

Meets first Friday of each month at Barr Branch Library, corner Jefferson and Lafayette Sts. Secretary, F. P. Menniges, 4019 Molozan Ave.

TOLEDO

Meets first Thursday of each month at Toledo University Science Building, Electro-Platers' Room, corner Cherry and Page Sts. Secretary, W. W. Weiker, 411 3d St., Toledo, Ohio.

TORONTO

Meets fourth Monday of each month at Canadian Foresters' Hall, 22 College St., Room No. 2. J. C. Cairns, 10 Wiltshire Ave., Toronto, Ontario, Canada.

WATERBURY

Meets every second and fourth Thursday of each month. Secretary, Wm. F. Guilfoile, Garden Theatre Bldg., East Main St., Waterbury, Conn.